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EXAMINER	
TRAN, QUOC A	

ART UNIT	PAPER NUMBER
2176	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/938,712	ROTH, CHANTAL	
	Examiner	Art Unit	
	Quoc A. Tran	2176	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to Amendment, filed 12/23/2004.

2. Claims 1-21 are pending.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al. US Patent No. 6,584,459 B1 issued 06/24/2003 filed 06/02/1999 (hereinafter '459), in view of Sabatini et al. US Patent No. 5,970,500 issued 10/19/1999 filed 05/15/1997 (hereinafter '500), further in view of Markowitz et al. US 20030009295A1- provisional application No. 60/275,465- filed- 03/14/2001 (hereinafter '295).**

In regard to independent claim 13, "*b. converting said data into a database-compatible language in a ...data warehouse*" as taught by '459 at col. 6, line 55 through col. 7, line 65 (i.e..... convert XML files into a storage format with predefined attribute values, storing XML documents internally within the DB2.RTM. database ...:);

"*c. storing said database compatible language in a ...data warehouse*", as taught by '459 at col. 6, line 55 through col. 7, line 65 (i.e..... Database Services module 708, which retrieves or receives the SQL statements and then derives or synthesizes instructions from the SQL statements for execution by the computer system 702 ... ... may be loaded from the data storage devices 704 into a memory of the computer system 702 for use during actual operations...);

'459 does not explicitly teach, "*... a biological data warehouse...* ", however as taught by '500 at col. 2, lines 5-10 (i.e. The present invention provides relational database systems for storing and analyzing bimolecular sequence information together with biological annotations detailing the source and interpretation of the sequence data...).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teaching of '459 that including a biological data relational to database system for storing and displaying genetic information. One of ordinary skill would be motivated to perform such a modification to save search time of the complex biological database, and enabling the researchers to utilized computer resources to explore any biological database, which is storing biological data such as, nucleic acid sequence information, and protein sequence, structure and function from DNA sequence data, for organisms such as Eschericia coli, Haemophilus influenzae, Mycoplasma genitalium, and Mycoplasma pneumoniae, among others..., as taught by '500 at col. 1, lines 25-60 (i.e..... to search database quickly...),

'459 and '500 do not explicitly disclose, "*a. receiving biological data in a transitional format, wherein the biological data comprises a plurality of different data types from a plurality of biological data sources*", however as taught by '295 at page 1 paragraph [0010] (i.e... gene expression, gene annotation, and sample information in a relational format supporting efficient exploration and analysis, the method comprising: providing a data warehouse which comprises a gene expression database for storing quantitative gene expression measurements for tissues and cell lines screened using various assays; a clinical database for storing information on bio-samples and donors; and a fragment index for biological properties for DNA fragments; providing a connector which permits loading of more than one source of gene expression, gene annotation, and sample information, receiving a query regarding gene expression of one or more DNA fragments; determining the level of gene expression of the one or more DNA fragments; correlating the level of gene expression with the clinical database and the fragment index; and displaying the results of said correlation).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified '295 into '459 and '500 to provide biological data in a transitional format, wherein the biological data comprises a plurality of different data types from a plurality of biological data sources. One of ordinary skill in the art would have been motivated to modify this combination to provide a relational databases for storing and retrieving biological information, which is using gene expression data from multiple sources in systems which provide gene expression, gene annotation, and sample information in a relational format supporting efficient exploration and analysis

biological data, as taught by '295 at page 1 paragraph [0003] (i.e... relational format supporting efficient exploration and analysis...).

In regard to dependent claim 14, "*mapping information into the formatted data*", as taught by '459 at col. 14, lines 38-45 55 (i.e..... In a DTD bounded indexing mechanism, the XML column is mapped to one DTD...).

In regard to dependent claim 15, "*mapping information is a mapping file*", as taught by '459 at col. 14, lines 38-45 (i.e..... mapped to one DTD. The DTD must be in the XML_DTD_REF table and application should get the DTDid before the index is created. Therefore, prior to indexing, the XML extender must: a) Parse the DTD and generate its internal tree structure, and b) Store DTD data into the XML_DTD_REF table...).

In regard to dependent claim 16, *"mapping information is embedded within said transitional formatted data",* as taught by '459 at col. 14, lines 38-45 (i.e..... mapped to one DTD. The DTD must be in the XML_DTD_REF table and application should get the DTDid before the index is created. Therefore, prior to indexing, the XML extender must: a) Parse the DTD and generate its internal tree structure...).

In regard to dependent claim 17, *"transitional format comprises extensible markup language definitions",* as taught by '459 at col. 8, lines 10-35 (i.e..... provides indexing of the XML documents stored within the DB2.RTM. database 300 or in the external file system 500. The XML extender 100 performs key transformations on indices provided by the DB2.RTM. database 300, creating an index that supports structural queries....the XML extender 100. In step S1, the DB2.RTM. database is

enabled, while in step S2, an abstract data type ADT, user defined functions UDFs, a DTD reference table and an internal registration table are created and user privileges are granted ...).

In regard to dependent claim 18, *"database-compatible language comprises SQL statements",* as taught by '459 at col. 7, lines 60-67 (i.e..... the UDFs 144 may be included in SQL statements to describe properties of XML documents via DB2XML attribute values...).

In regard to claims 1, 5 and 19, are directed to a system for performing the method of claim 13, and are similarly rejected along the same rationale.

In regard to dependent claims 2, and 4, are directed to a system for performing the method of claim 17, and are similarly rejected along the same rationale.

In regard to dependent claim 6, is directed to a system for performing the method of claim 18, and is similarly rejected along the same rationale.

In regard to dependent claim 3, *"wherein the markup language transforms said data entries into an application and platform-independent form",* as taught by '459 at col. 1, lines 60-67 (i.e..... (XML), which is a subset of Standard Generalized Markup Language (SGML), has been proposed to the World Wide Web Consortium (W3C) as the next standard format. XML is a meta language, allowing a user to design a customized markup language for many classes of structured documents (i.e. independent platform of markup language transforms...).

In regard to dependent claim 7, *"a graph generator for generating a data warehouse graph",* as taught by '459 at Abstract (i.e..... created B+ tree index structures implemented in the database system to support the indexes...).

In regard to dependent claim 8, *"wherein said data warehouse graph is used to represent the schema of said data warehouse, wherein said data entries may be processed in a logical order",* as taught by '459 at Abstract (i.e..... created B+ tree index structures implemented in the database system to support the indexes...).

In regard to dependent claim 9, *"a data verifier for comparing said data entries with data present in said data warehouse",* as taught by '459, col. 23 line 60 through col. 24, line 5 (i.e..... One of the structural search queries used with the present invention refers to finding the XML documents containing certain terms in the specified structural path. Using the example illustrated above ... The function returns integer 1 if the document satisfies the search argument and otherwise returns a 0...).

In regard to dependent claim 10, "*wherein said data verifier is configured to populate incomplete data entries by retrieving the missing information from the data warehouse",* as taught by '459 at col. 22, lines 60-67 (i.e..... Update Attribute Values Individually...).

In regard to dependent claim 11, "*a key generator wherein primary and foreign database keys are created within said data warehouse",* as taught by '459 at col. 7, lines 40-55 (i.e..... The ADT (abstract data type) 142 is a relational facility introduced by DB2.RTM. Version 6 allowing the user to define new and distinct data types and

subtypes to a database engine...version 6 ADT feature, a set of methods called accessor methods is automatically. Generated when DB2XML ADT 142 is created...).

In regard to dependent claim 12, ***"file splitter for splitting large data files to facilitate easier loading of complex data files",*** as taught by '459 at col. 9, lines 25-30 (i.e..... The content attribute is a character-based large object (CLOB) containing the XML document if stType is XML_CLOB, and is null otherwise. The size attribute represents the size of the XML document in term of bytes...), and also as taught by '459 at col. 9, lines 45-50 (DB2XML(DTDid int, stType int, fileName varchar(256), content clob(10k), size int, creator varchar (20)...), and also as taught by '459 at col. 10, lines 345-50 (...for long XML documents, use of xmlFromFile( ) or xmlFromCLOB( ) is recommended...).

In regard to dependent claim 20, *"wherein the different data types are non-uniform data types",* however as taught by '295 at page 1 paragraph [0010] (i.e... gene expression, gene annotation, and sample information in a relational format supporting efficient exploration and analysis, the method comprising: providing a data warehouse which comprises a gene expression database for storing quantitative gene expression measurements for tissues and cell lines screened using various assays; a clinical database for storing information on bio-samples and donors; and a fragment index for biological properties for DNA fragments; providing a connector which permits loading of more than one source of gene expression, gene annotation, and sample information, receiving a query regarding gene expression of one or more DNA fragments; determining the level of gene expression of the one or more DNA fragments; correlating

the level of gene expression with the clinical database and the fragment index; and displaying the results of said correlation).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified '295 into '459 and '500 to provide biological data in a transitional format, wherein the different data types are non-uniform data types. One of ordinary skill in the art would have been motivated to modify this combination to provide a relational databases for storing and retrieving biological information, which is using gene expression data from multiple sources in systems which provide gene expression, gene annotation, and sample information in a relational format supporting efficient exploration and analysis biological data, as taught by '295 at page 1 paragraph [0003] (i.e... relational format supporting efficient exploration and analysis...).

In regard to dependent claim 21, incorporate substantially similar subject matter as cited in claim 13 above, and in further view of the following, and is similarly rejected along the same rationale.

"wherein biological data is in a uniform data type", however as taught by '295 at page 3 paragraph [0036] (i.e... Extract and validate selected experiments into the staging database: A user selects a list of experiments from a registered expression data source. All experiments in the same batch preferably come from the same expression data source..).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified '295 into '459 and '500 to provide biological data in a transitional format, wherein the different data types are non-uniform data types.

One of ordinary skill in the art would have been motivated to modify this combination to provide a relational databases for storing and retrieving biological information, which is using gene expression data from multiple sources in systems which provide gene expression, gene annotation, and sample information in a relational format supporting efficient exploration and analysis biological data, as taught by '295 at page 1 paragraph [0003] (i.e... relational format supporting efficient exploration and analysis...).

Response to Argument

4. Examiner has completed a through study of Applicant's Amendments of 12/23/2004; especially, Applicant's amended to claims 1, 13, newly added claims 20-21 and remarks at pages 5-10.

5. As for amended claims 1, 13, newly added claims 20-21 have been fully considered but are moot in view of the new ground(s) of rejection.

Reponses to Remarks pages 5-10:

Applicant argues that, Chang, in view of Sabatini do not teach, biological data comprises a plurality of different data types from a plurality of biological data sources. The Office respectfully disagreed, the reason is set forth in the previous rejection, however the new ground(s) of rejection is necessitated by the amended claims 1, 13, and newly added claims 21-22; For more evident the following clearly instituted the claim limitation, as taught by '295 at page 1 paragraph [0010] (i.e... gene expression, gene annotation, and sample information in a relational format supporting efficient

exploration and analysis, the method comprising: providing a data warehouse which comprises a gene expression database for storing quantitative gene expression measurements for tissues and cell lines screened using various assays; a clinical database for storing information on bio-samples and donors; and a fragment index for biological properties for DNA fragments; providing a connector which permits loading of more than one source of gene expression, gene annotation, and sample information, receiving a query regarding gene expression of one or more DNA fragments; determining the level of gene expression of the one or more DNA fragments; correlating the level of gene expression with the clinical database and the fragment index; and displaying the results of said correlation).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to have modified '295 into '459 and '500 to provide biological data in a transitional format, wherein the biological data comprises a plurality of different data types from a plurality of biological data sources. One of ordinary skill in the art would have been motivated to modify this combination to provide a relational databases for storing and retrieving biological information, which is using gene expression data from multiple sources in systems which provide gene expression, gene annotation, and sample information in a relational format supporting efficient exploration and analysis biological data, as taught by '295 at page 1 paragraph [0003] (i.e... relational format supporting efficient exploration and analysis...).

Therefor the claims 1-21 remain rejected.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc A. Tran whose telephone number is (571) 272-4103. The examiner can normally be reached on Monday through Friday from 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph H. Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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SANJIV SHAH
PRIMARY EXAMINER

Quoc A. Tran
Patent Examiner
Technology Center 2176
April 2, 2005